THE MHIRT NEWSLETTER - STAYING CONNECTED
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THEY ARE HOME. THE POST-RESEARCH WORKSHOP WAS GREAT. WELCOME TO *E HO'OULU HAUMANA*

As the headliner says, 2016 MHIRT students have returned and completed a 3-day post-research workshop.

Research Accomplishments: Each student was asked to write 4 sentences summarizing their research abroad. Here is what they wrote.

Tiana Elisara: HIV still remains a major health concern claiming more than 35 million lives with no current cure. The problem is the inability of current drug therapies, combined antiretrovial therapy (cART), to fully eradicate HIV in its latent form. To test the association of *H. pylori* with HIV latency and inflammation, *in vitro* experiments were conducted on latent HIV-1-infected monocytic cell lines (U1) and parental cell line, U937 with no virus. We conclude that HIV and *H. pylori* interact via cell-to-cell contact to activate specific downstream pathways during HIV co-infection leading to IL-1□production.

Michael Fernandez: Hepatitis C virus (HCV) has seven different genotypes and over 50 subtypes and affects the lives of more than 170 million people. In Cameroon genotypes 1, 2 and 4 are circulating in the population, which increases the chances of recombination. The goal of the project was to characterize the HCV circulating in Cameroon by performing nested PCR on the capsid region and NS5B protein and conducting a phylogenetic analysis to study potential recombinants. Seventy-six samples were analyzed and one potential recombinant was found. Knowing if recombinant viruses are present is beneficial because recombination may lead to drug resistance and avoidance of immune responses.

Gabrielle Gregorio: Melioidosis is a world-wide public health issue caused by the bacterium *Burkholderia pseudomallei*. Genetic variations, such as single nucleotide polymorphisms (SNPs), are present in the humans that can affect disease outcome in a infected person. My objective was to genotype DNA from melioidosis patients using seven previously identified SNPs that regulate death in melioidosis in order to analyze the association between genotype and mortality. Findings from this study can identify potential melioidosis patients with an increased chance of death and treat them accordingly.

Michael Meno: The goal of my summer research was to characterize mouse monoclonal antibodies (mAbs) against Chikungunya virus (CHIKV) in order to create an immunochromatographic (IC) test for the rapid diagnosis of CHIKV infection. My results identified over ten mAbs with the ideal characteristics for the assembly of an IC test against CHIKV. Diagnosis of CHIKV infection can be difficult because current methods require sophisticated laboratory equipment and because CHIKV shares similar symptoms with dengue and Zika viruses. The mAbs characterized in this study will be assembled into an IC test for the cheap, rapid, and effective diagnosis of CHIKV infection.

John Ngo: My project titled "*Helicobacter pylori* modulates HIV pathogenesis" is an attempt to recognize how *H. pylori* breaks HIV latency. Research is now underway to cure HIV infection. One possible method to cure HIV infection is the "kick and kill" method where HIV latency is reversed and reservoirs can be removed by the immune system. The elimination of *Helicobacter pylori* has been observed to increase CD4 cell counts in latent HIV infected patients. Our study aims to identify the molecular mechanisms underlying *H. pylori* and HIV co-infection that are associated with reversal of HIV latency using gene set enrichment analysis (GSEA).

Tiffany Nguyen: My objective was to develop loop-mediated isothermal assay (LAMP) for rapid diagnosis of polyomavirus BK (BKV reactivation in chronic kidney disease (CKD) patients. For initial screening, PCR was utilized and 2 out of 50 CKD patients were found to be positive for BKV. LAMP was also successful in detecting these positive samples. This technique was also capable of detecting virus in urine and plasma samples without the need for DNA extraction from a confirmed BKV associated nephropathy (BKVAN) patient. With its simplicity and ability to detect virus in unprocessed samples, LAMP has the potential to be useful in point-of-care settings as a means of rapidly diagnosing BKV.

Ernest Puletasi: My research project was to identify non-tuberculosis mycobacterium (NTM) within cultured isolates from patients in Cameroon suspected of having tuberculosis. I successfully tested 60 samples using a DNA strip kit called Genotype AS/CM assay. Of the 60 samples tested, 33 had single NTM

infection and 11 had two different NTM infections. The most common species identified in this study were *Mycobacterium intracellular* and *Mycobacterium smegmatis*. Further studies will look at the clinical relevance of these infections in the patients.

Jefferson Remo: The overall goal of my project was to better refine the delivery and accessibility of Pre-exposure prophylaxis (PrEP) in high-risk populations in Thailand. Populations, such as sexually active Men who have sex with men, transgender women, sex workers and many other populations, are at risk. In my analysis, results confirmed that these high-risk populations should be given PrEP when they are HIV negative, by doing so we can eliminate the health disparity within these populations. Then, in the future, we can eliminate HIV from the global population.

Saying Good-Bye and Lasting Memories: We asked the students to send us one photo that summed up their feeling upon leaving and one photo that will "always remain in their hearts" when they think about Thailand, India or Cameroon. Here are their photos:

Pau Hana: Looking forward to seeing everyone for the *E Ho'oulu Haumana* on Thursday, August 11, 2016 @ 5:30 PM at JABSOM Kakaako. Please look at the acknowledgements page for all the mentors, instructors, speakers and MHIRT Advisory Committee who have made MHIRT 2016-Hawai'i possible. Our heart-felt MAHALO to them all!

MHIRT 2016 Students

- Tiana Elisara
- Michael Fernandez
- Gabrielle Gregorio
- Michael Meno
- John Ngo
- Tiffany Nguyen
- Ernest Puletasi
- Jefferson Remo

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- Maria Stewart, PhD
- Saguna Verma, PhD
- Richard Yanagihara, MD, MPH
- Sam Tassi Yunga, MD

India Mentors

- Ravi Tandon, PhD
- Vidhya Natarajan

Cameroon Mentors

University of Yaounde I, Biotechnology Center

- Rose Leke, PhD

Institute of Medical Research and Medicinal Plant Studies (IMPM)

- Gabriel Agbor, PhD

Centre Pasteur du Cameroon (CPC)

- Sara Eyangoh, PhD
- Richard Njouom, PhD
- Ngu Abanda

Thailand Mentors

Mahidol University

- Narisara Chantratita, PhD
- James Kelley, MPH, PhD
- Pornsawan Leaungwutiwong, PhD
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- Tatsuo Shioda, PhD
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South East Asia Research Collaboration with Hawaii (SEARCH)/Thai AIDS Research Center

- Nittaya Phanuphak, MD, PhD
- Deondara Trachunthong

MHIRT Advisory Board Committee

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- Richard Yanagihara, MD, MPH

MHIRT Program Course Instructors and Invited Speakers

- Vernon Ansdell, MD
- James Campbell, PhD
- Sandra Chang, PhD
- John Chen, PhD
- David Clements, PhD
- May Rose Dela Cruz, DrPH
- Joe Elm, PhD
- John Galland, PhD
- William Gosnell, PhD
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- Heidi Lum
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- Lishomwa Ndhlovu, MD, PhD
- Catherine Pirkle, PhD
- Yukie Lloyd Sato, MS
- Tina Shelton
- Alice Tse, PhD, RN
- Richard Yanagihara, MD, MPH
- Sam Tassi Yunga, MD

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